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GRADING ROSIN AT THE STILL.

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INTRODUCTION.

A simple, accurate method whereby the producer can grade rosin at the still at the time it is made and thus know the grade of the rosin shipped has long been needed. The methods now used are exceedingly crude and it is very rare that the producer, when he tries to grade his rosin before shipment, gets a sample of the proper size for the purpose, unless he has some one skilled in cutting samples. There is at times a decided difference of opinion between producer and buyer as to the correctness of the grading of certain lots of rosin.

It has been stated that the difference in market value caused by misgrading varies from 5 to 60 cents and at times on some grades reaches \$1 per 280-pound barrel. As approximately 4,000,000 280-pound barrels, having a value of from \$12,000,000 to \$20,000,000, are produced annually, the matter of correct grading is one of much importance both to the producers and the users of rosin.

A method which does away with cutting the sample has been devised. It is that of replacing the cut sample with a molded sample of exact size, by which the producer can himself grade the rosin as it is made at the still, and thus know definitely before shipment exactly what his product will grade.

APPARATUS.

All that is needed for grading at the still is a mold into which to pour the hot rosin, an ordinary tin dipper, a smooth piece of iron or other metal, and a set of standard rosin types. These are all shown in figure 1.

The mold is made of two pieces of ordinary roofing tin. It is about $1\frac{1}{2}$ inches high and exactly $\frac{7}{8}$ inch wide on the sides, inside measurement. This is the size to which the standard grade samples should be cut. The tin is bent in the form shown in the figure and is held together by slightly flaring the larger or three-sided piece of the mold, the free edges of which hold against the fourth side, which has two edges bent at right angles, as shown, for this purpose. The way the mold is put together is shown in the center of the figure. A careful mechanic can readily make the molds. They should be made of thin springy metal (roofing tin is suitable); otherwise the mold can not be removed from the block without breaking the rosin and spoiling its shape. The mold must be exactly $\frac{7}{8}$ inch on the side, inside measurement. The proper size can best be gotten by bending the tin over a $\frac{7}{8}$ -inch square iron bar.

METHOD OF GRADING.

Before using the mold is polished inside with earth which will not scratch, and is washed and dried. If rosin has stuck to the inside of the mold from a previous test, it is dissolved off by soaking in turpentine.

To get a sample for grading, the clean, dry mold is put together and placed upon the smooth metal plate. After the surface of the rosin in the barrels recently filled from the vat has cooled and stiffened considerably take a sample with the tin dipper, reaching down into the barrel as far as possible, and carefully pour into the mold until it is nearly full. It is very important that this mold be not touched or moved until it and the rosin it contains are cold. Then strike the metal plate sharply to loosen the rosin from it; remove the mold from the rosin block by inserting a knife blade or the thumb nail under the edges of the small side of the mold, as shown in the figure, and gently prying it loose. The second or three-

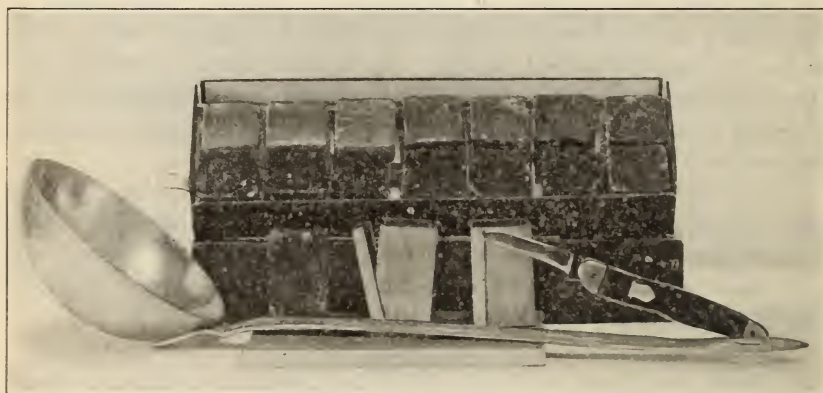


FIG. 1.—Apparatus used for grading rosin.

sided piece of the mold should be removed in the same manner, leaving the block of rosin unbroken. This block, exactly seven-eighths inch wide on each side, shown at the left in the figure, is representative of the charge of rosin and may be compared with the type samples just as the samples cut from the barrels by the rosin inspectors at the primary markets are now compared with the type samples.

The producer provided with a set of type samples compares the samples made during the day with them and records in any convenient manner the grade of each charge. A suitable way to do this, and the one which is suggested, is to number consecutively each barrel of rosin produced during the season, commencing with "1" in the spring, and marking all barrels sent to market. The grade of each barrel as determined when made can be recorded in a book kept for that purpose and the returns of sale and grade of each barrel as determined by the inspector can be made on each numbered barrel.

In case of difference between the producer's and the inspector's grading, the error can be readily located and corrected. The fact that the producer knows the grade of each barrel will operate to make the inspector more careful in grading, particularly in cutting samples, and any tendency to variation and low grading will be largely eliminated.

The grading of rosin should be done under a shed, the sample and the type being looked through when held toward a clear north sky or against a window covered with a piece of white paper or cotton. Before deciding which is the darker, the sample or the type, their positions should be reversed; that is, if the type is on the right side it should be compared with the sample by placing it on the left side also. If the sample is darker in both positions, or darker in one and the same color as the type in the other, it is a lower grade than the type with which it is being compared. It should be remembered that a sample must be as light or lighter in color than the type in order that it may be graded equal to the type.

DISCUSSION.

The sample used for the mold should not be taken until the rosin has cooled considerably in the barrel and its surface stiffened somewhat so that the rosin may reach its full color in the barrel. It has been claimed that rosin dipped into barrels continues to get darker until it has become cold. The experience of this bureau indicates but slight darkening after barreling, and as a rule only one sample need be taken from each charge. A number of experiments showed no difference in color between the first and last barrel dipped from the vat, unless a great deal of dirt passed the strainer and settled to the bottom; in this case, of course, the last barrel may be thrown off grade because of the dirt which it contains. Rosin samples cut from barrels several weeks after the rosin was made have been found to check with the samples taken with the mold at that time. The fact, too, that samples taken from the bottom head of barrels filled from a single charge of well-strained rosin rarely differ from those taken from the top head more than one grade is indicative of but little change in color during cooling. It seems reasonable to think that if there is material change in color of rosin after being placed in the barrel a greater difference would be seen in samples from the top and bottom heads of higher grades especially, as the rosin in the lower part of the barrel is kept under pressure at a higher temperature for a longer time. It is confidently believed, therefore, that samples taken from near the top head after partial cooling will give the same results as samples taken from the same section after cooling.

By far too much low-grade rosin is being made. There are three chief causes for this: First, the presence in the gum in the still of

considerable quantities of wood, bark, pine needles, charcoal, and dirt which, through carelessness, accident, or both, have gotten into the gum in the woods and the larger part of which remains in the still during distillation. The effect of the presence of this foreign material in the still is possibly well known to rosin producers and it is most strikingly shown by the higher grades obtained from the same gum by using the cup and gutter system of turpentine, especially when care is taken to keep out of the cups the bark and wood liable to drop into them during chipping. Second, excessive heating or prolonged heating of the rosin in the still at the close of distillation, largely for the purpose of removing all turpentine and water which it may contain. Third, the presence in the finished rosin of much finely divided foreign material, such as charcoal and earth mentioned above, due to faulty straining of the finished rosin.

Approximately 30 per cent of the rosin made is graded lower than F. The observations of the Bureau of Chemistry indicate that but little of this grades lower than F in color. Rosins which had been graded A, B, C, D, and E when dissolved in turpentine or alcohol, carefully strained and the solvent evaporated with heat, all grade higher, many of them F or better, thus showing that these rosins were graded low because of the foreign material they contained, which had not been removed in straining, rather than because of the color of the rosin itself. The foreign material these low-grade rosins contain is largely fine charcoal which has gotten into the gum from burnt boxes or has blown into the boxes. It is also in part sand and soil which has gotten into the gum in the same way. In ordinary seasons it would pay well to make F rosin from gum which commonly yields E, D, or B rosins. Greater care in the woods, and especially greater care at the still, will enable the producer to do this.

Approved:

JAMES WILSON,

Secretary of Agriculture.

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